

**Building a *Warrior*: Industry, Empire and the Royal Navy's Iron Ships 1847-1860**

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## **Abstract**

Between 1845 and 1860, the Royal Navy engaged in transitioning from wooden hull construction to those built of iron. Though HMS *Warrior* has consistently been identified as the first successful British iron ship of war, the role of the economy, diplomacy, politics and industry in the developmental process of *Warrior* has not been fully developed in the historiography. Previous work on the Royal Navy's nineteenth century trajectory has inordinately focused on outdated methodologies of military history. These historians neglected to reconcile the role played by the Admiralty in politics, diplomacy, industry and economy, and the part each of these elements played in the creation of a cohesive maritime defense of the British Empire. *Warrior* represents the collective manifestation of the aforementioned four themes out of the British Empire of the long nineteenth century. How these forces helped shape and reshape the military's response to various challenges against the British Empire's will be explored through sources like *The Times* and *The United Service Magazine*, the yearly Naval Estimates as a part of the broader Parliamentary Budget, and the various records of the private shipbuilding companies involved in the early iron construction for the Royal Navy and private commercial use. The role played by the Admiralty in the maintenance and defense of the British imperial domain is critically important to fully understand the relationship between the Royal Navy and the British Empire during the middle of the nineteenth century. A close study of the transition from HMS *Sirioom* through *Warrior* will help establish links between the British political system, the British imperial economy, British industry and the British diplomatic policy and the construction of these respective warships.

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## Definitions

**Admiralty:** the governmental body tasked with the maintenance and construction of the Royal Navy. Its staff consisted of both high ranking naval officers politically appointed, and civilians filling various roles. The Admiralty was responsible for determining ship design based on the money granted in the Naval Estimates, though Parliament could dictate construction based on political and strategic need.

**Frigate:** a type of ship-rigged warship with a single long gun deck and good sailing qualities. British frigates typically carried between twenty-eight and forty-four guns.

**Ship of the Line:** a broad category of ship-rigged warship defined solely theoretically capacity to stand in the line of battle. British first, second and third rates were considered ships of the line, though the Admiralty favored third rates both because of their economy and maneuverability. Fourth rates were, in the early eighteenth century, considered ships of the line, but were outclassed and phased out entirely by the mid-century.

**British Rating System:** a system used by the Admiralty to officially categorize ships of the Royal Navy, typically based on the number of cannons carried. It was changed in 1817 to include carronades (previous incarnations had included only cannons) and again in 1856 as a response to changes in military technology.

**First Rate:** under the British Rating system, a first rate was a ship-rigged warship with three gun decks officially mounting between 100 and 120 cannons.

**Second Rate:** under the British Rating system, a second rate was a ship-rigged warship with three gun decks officially mounting between 90 and 98 cannons.

**Third Rate:** under the British Rating System, a third rate was a ship-rigged warship that officially carried between 64 and 80 cannons.

**Fifth Rate:** under the British rating system, a fifth rate was a ship-rigged warship with one gun deck mounting between 34 and 44 cannons.

**Razee:** ships of the line with reasonable sailing qualities, cut down to a single gun deck to provide excellent firepower.

**Sixth Rate:** under the British Rating system, a sixth rate was a ship-rigged warship with a single gun deck mounting between 20 and 28 guns.

## Introduction

*Pax Britannia* is the epitaph often ascribed to the nineteenth century global order. Naval dominance assured the security and economic position of the British Empire from the end of the Napoleonic conflict through the outbreak of the First World War. The institution responsible for maintaining this position during the nineteenth century, the Admiralty, successfully moved from a sailing fleet of wooden ships with smooth bore cannon to a coal or oil powered fleet of iron craft with rifled guns firing explosive shells. In doing so, Britain maintained its leading position at a dangerous time when other Great Powers were actively developing new technologies that would rival those of Britain. This transition was neither inevitable nor deliberately planned. Instead, the Admiralty both responded to and consciously pursued several technological and strategic changes ultimately resulting in this transformation. The development of iron hulls, bookended by the beginning of construction on HMS *Simoom* in 1847, and the launch of HMS *Warrior* in 1860, highlights one of the successive periods of transition during the long nineteenth century. Though the story of these warships is not unknown to historical scholars, previous studies have neglected to place either of these iron constructs in the broader context of Britain's competitive advantages and political concerns. *Simoom* and *Warrior* represent not only the expression of British military hardware in 1847 and 1860, but also the manifestation and the needs of the diplomatic, political, economic and technological trends coalescing and responding to Admiralty policy during this period. *Simoom* and *Warrior*'s construction must be reimaged in this broader context.

## Literature Review

The construction of *Warrior* has been examined extensively in academic historiography. Several historians have established a significant place for this ship in the traditional military literature. Andrew Lambert's two books *The Creation of the Steam Battlefleet, 1815-1860* and *The Last Sailing Battlefleet: Maintaining Naval Mastery, 1815-1850*, and John Beeler's *Birth of the Battleship: British Capital Ship Design 1870-1881*, fundamentally shape the traditional historical discussion of *Warrior* and the nineteenth century Royal Navy.<sup>1</sup> Lambert points to *Warrior* irrevocably changing the strategic tools of the Britain's naval mastery and warship construction.<sup>2</sup> These monographs each overlook the broader questions as to how and why *Warrior* was constructed at this particular moment and in this particular way. Though Beeler and Lambert provide a detailed understanding of *Warrior* from a military perspective, neither places the frigate within the political, economic and industrial dynamics that gave Britain its advantage in this period.<sup>3</sup> These historiographical themes must be engaged to provide an understanding of this frigate's construction within the broader setting of nineteenth century British imperial society. Contextualizing *Warrior* within these themes provides some answers about how Britain maintained naval mastery and empire in a rapidly changing international world. This study of the transition from *Simoom* to *Warrior* addresses these important questions within the historiographical context.

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<sup>1</sup> Andrew Lambert, *The Creation of the Steam Battlefleet, 1815-1860*. (London, Naval Institute Press, 1984,) Andrew Lambert, *The Last Sailing Battlefleet: Maintaining Naval Mastery, 1815-1850*, (London, Conway Maritime Press, 1991) and John F Beeler, *Birth of the Battleship: British Capital Ship Design, 1870-1881*, (London, Chatham Publishing, 2001.)

<sup>2</sup> Lambert, *The Creation of the Steam Battlefleet, 1815-1860*, 77.

<sup>3</sup> Ibid., and Beeler, *Birth of the Battleship*.

Traditional military history has been exposed as a problematic historical methodology. Not only is it explicitly focused on technological progressivism, but it is also dominated by the European militaries and their dominance over each other and non-Europeans. Touchstone historical narratives, like nineteenth century British naval hegemony, further shape traditional military historiography. Several historians have discussed methodological alternatives to traditional military history. This study is shaped by two of these works. Jeremy Black's *Rethinking Military History* provides a direction for this study of the transition from *Simoom* through *Warrior*'s construction, whereas Howard J. Fuller's *Empire Technology and Seapower* provides an exemplar, though highly problematic, of a reformatted military history methodology in action. Both Black and Fuller characterize the historiographical landscape this study of the mid nineteenth century Royal Navy engages with.

*Rethinking Military History* convincingly argues that military history still has a significant place within the historical practice, though Black acknowledges that this is not in the form that it has previously taken.<sup>4</sup> He points out that the traditional military history, which focuses on battles and progressive military advancement advancing the European methods of war fighting, should be cast aside in favor of a new set of historical practices.<sup>5</sup> He also argues previous military historians focused on what are termed 'military revolutions:' the transition from medieval knight to pike, from pike to musket and from musket to rifle.<sup>6</sup> While Black condemns this methodology as Eurocentric, he does employ the associated traditional periodization in his discussion of

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<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid., 26-59.

military methodology.<sup>7</sup> This flaw does not take away from his argument that historians should focus on an examination of how these military events and developments happened when they did, and, more importantly, why.<sup>8</sup> Instead, historians should continuously strive to avoid such pitfalls, rejecting them as a part of a military methodology that Black unsuccessfully refutes in *Rethinking Military History*. A study of the transition from *Simoom* through *Warrior* through the themes of politics, economy and industry fits into this suggestion of a new understanding of military history, rejecting the notion of a naval revolution manifested through iron.

Fuller's *Empire, Technology and Seapower* further rejects the traditional historical narrative espoused by Lambert and Beeler. Arguing that British rhetoric about their navy was far removed from the actual wartime capacity of the Royal Navy, Fuller underlines the continuous anxiety concerning the vulnerability of the imperial domains and the difficulty applying naval power in continental warfare.<sup>9</sup> He further argues that the Royal Navy lacked the capacity to assault or destroy shore fortifications, highlighting the apparent insufficiencies of ships like *Warrior* in comparison to USS *Monitor*.<sup>10</sup> However, in spite of his relatively sound challenge to previous historians like Lambert and Beeler, Fuller fails to fully appreciate the naval expertise of the nineteenth century British Empire. Though he is correct about British rhetoric failing to match British military capability, oratory rarely balances proficiency in this regard. Further, *Empire Technology and Seapower* neglects to acknowledge Britain's resiliency, in spite of the periodic, though temporary, periods of military vulnerability. Much like the monographs

<sup>7</sup> Ibid., 66-99.

<sup>8</sup> Ibid.

<sup>9</sup> Howard J. Fuller, *Empire, Technology and Seapower*, (Routledge, New York, 2013,) 1-10.

<sup>10</sup> Ibid., 226-30.

propagated by Beeler and Lambert, Fuller's study of the nineteenth century Royal Navy lacks a close examination of the very elements enabling Britain's maintenance of naval hegemony throughout the period. A historical study of the period between *Simoom* and *Warrior*, framed through British industry, economy and diplomacy, provides a more holistic examination of this topic.

Britain's position as the first global industrial power is undisputed historically.<sup>11</sup> *Warrior* and *Simoom*'s constructions are the direct result of this legacy. An examination of the transition between these two iron frigates employing the methodology espoused by new military history should incorporate Britain's industrial power as a significant part of the investigation. Sidney Pollard's *Peaceful Conquest: The Industrialization of Europe 1760-1970* and Tom Kemp's *Industrialization in Nineteenth Century Europe* provide a broad overview of the process of this period and discuss the broader implications of the Industrial Revolution within the context of the British Empire.<sup>12</sup> For this study, their focus on the United Kingdom will be engaged. Critically for this study, Kemp and Pollard point out Britain's iron industry as the first capable of large-scale projects.<sup>13</sup> Their focus on the development and strength of the British iron industry will buttress this project's discussion on the use of metallurgy to build *Simoom* and *Warrior*, through the lens of the private shipbuilding sector. How Britain became the first industrial power is largely

<sup>11</sup>David Cannadine "The Present and the Past in the English Industrial Revolution, 1880-1980," in *The Industrial Revolution and Work in Nineteenth Century Europe*, edited by Lenard R. Berlanstein (New York, Routledge, 1992), 27-8.

<sup>12</sup> Sydney Pollard, *Peaceful Conquest: The Industrialization of Europe, 1760-1970*, (New York, Oxford University Press, 1981,) v-ix and Tom Kemp, *Industrialization in Nineteenth Century Europe*, (London, Longmans, Green and Co., Ltd. 1969,) vii-ix. Other historians who have made significant contributions to the historiography of nineteenth century Britain's industrial capacity include Lenard R. Berlanstein in *The Industrial Revolution and Work in Nineteenth Century Europe* Gregory Clark in *A Farewell to Alms: A Brief Economic History of the World*, M. J. Daunton, in *Progress and Poverty: An Economic and Social History of Britain, 1700–1850* and Emma Griffin in *A Short History of the British Industrial Revolution*.

<sup>13</sup> Ibid.

unimportant for a study of the transition of iron ships construction from *Simoom* through *Warrior* as manifested through political, economic and industrial interests, but the United Kingdom's primacy is an important factor made clear by both Kemp and Pollard.<sup>14</sup> However, British industry did not exist independently of other factors within the broader British Empire: without the vital British political economy, the British shipbuilding industry could not have maintained its naval leadership in the 19<sup>th</sup> century.

The British military, industry and economy are inevitably intertwined during the nineteenth century. Britain's military defended and enabled economic growth internationally. In turn, the economy reshaped the strength and character of the British military, forcing the two potentially disparate forces into discourse. Paul Kennedy's *The Rise and Fall of the Great Powers: Economic Change and Military Conflict From 1500 to 2000* highlights this role. Kennedy further argues relative economic power, manifested through foreign trade and domestic production, constitutes real power and in these arenas Britain came to lead in the 19<sup>th</sup> century.<sup>15</sup> This approach directly opposed the traditional military view of state power, which often considers absolute military might through the lens of men and women under arms and the apparent capacity of military hardware.<sup>16</sup> However, Kennedy disregards the role of Empire in shaping the economic fortunes or military and strategic needs of the metropolis. Other historians have developed the role of the wider Empire in the British economy. *Great Britain and the*

<sup>14</sup> Ibid.

<sup>15</sup> Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000*, (New York, Random House, 1987,) xv. Other historians who have discussed the nineteenth century British economy include P. J. Cain in *Economic Foundations of British Overseas Expansion, 1815–1914*, James Foreman-Peck in *A History of the World Economy: International Economic Relations Since 1850*, Charles P. Kindleberger in *A Financial History of Western Europe*, Alan S. Milward and S. B. Saul in *The Economic Development of Continental Europe* and Judith Blow Williams *British Commercial Policy and Trade Expansion, 1750-1850*.

<sup>16</sup> Ibid., 154.

*Colonies: 1815-1865* represents a compendium of economic historical pieces focused on this relationship.<sup>17</sup> Two essays, “The Imperialism of Free Trade,” by John Gallagher and Ronald Robinson, and Oliver MacDonagh’s “The Anti-Imperialism of Free Trade” highlight the role of formal and informal Empire within the wider British economic landscape.<sup>18</sup> Further, both highlight how this changed as the political network within the British Empire committed itself to free trade instead of mercantilist protectionism.<sup>19</sup> These arguments on the role of the British economy and the strategic need for its defense will be employed in this study of the transition of iron ships from *Simoom* to *Warrior*. However, despite both works acknowledging that Britain defended their economic interests internationally, neither invests significant time investigating how this defense was achieved.<sup>20</sup>

A close discussion of the nineteenth century British political economy and industry does not articulate the reasons behind the timing and shape of *Warrior*'s construction. The role of diplomacy in forming *Warrior* must also be considered to provide a full picture of the nineteenth century British Empire that produced this ship. *Simoom* was built in the 1840s, at a time when the Great Power compact known as the ‘Concert of Europe’ still provided the basis of the diplomatic bedrock of Europe. In contrast, *Warrior* was built in the aftermath of the Crimean War of the 1850s and at a time when new Great Power wars were underway that would engage the French, the Austrians and eventually the Prussians. Several historians have addressed the destruction of the Concert of Europe and the ramifications for European diplomatic

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<sup>17</sup> *Great Britain and the Colonies: 1815-1865*, edited by A. G. L. Shaw, (London, Methuen & Co Ltd., 1970,) 5-6.

<sup>18</sup> Ibid., 142, 165.

<sup>19</sup> Ibid.

<sup>20</sup> Ibid.

landscape. Paul Schroeder's *Austria, Great Britain and the Crimean War: The Destruction of the Concert of Europe* represents the foremost view on the relationship between the Crimean conflict and the end of the diplomatic international order that had existed since the end of the Napoleonic Wars.<sup>21</sup> *Austria, Great Britain and the Crimean War* argues that the conflict with Tsarist Russia ultimately ended the 'Concert of Europe' that had helped balance the ambitions of the European powers.<sup>22</sup> Schroeder also highlights Britain's fundamental interest in maintain the balance of power in Continental Europe.<sup>23</sup> Maartje Maria Abbenhuis builds upon Schroeder's ideas. Her recent work, *An Age of Neutrals: Neutrality and Great Power Politics, 1815 – 1914*, centers upon the concept of neutrality as it played out during the nineteenth century.<sup>24</sup> Abbenhuis argues that Britain's default position during the long nineteenth century was neutrality.<sup>25</sup> However, she also point out that this was not the misunderstood neutrality that was pursued by permanent neutrals such as Switzerland.<sup>26</sup> Instead, it was armed neutrality: neutrality with the military to enforce non-participation in conflict and to ensure the continuance of Britain's global trade.<sup>27</sup> Britain's desire to maintain its capacity to pursue neutrality during European conflict was threatened by the destruction

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<sup>21</sup> Paul W. Schroeder, *Austria, Great Britain and the Crimean War: The Destruction of the European Concert*, (Ithaca, Cornell University Press, 1972,) xi-xvii. Other historians who have discussed the role of diplomacy in nineteenth century Britain include Bourne, Kenneth in *The Foreign Policy of Victorian England: 1830-1902*, Philip D. Curtin in *The World and the West: The European Challenge and the Overseas Response in the Age of Empire*, C. I. Hamilton, *The Anglo-French Naval Rivalry: 1840-70*, Paul Kennedy in *The Rise and Fall of British Naval Mastery* Rich Norman in *Why the Crimean War?: A Cautionary Tale* and R. K. Webb in *Modern England: From the 18<sup>th</sup> Century to the Present*.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

<sup>24</sup> Maartje Maria Abbenhuis, *An Age of Neutrals: Neutrality and Great Power Politics, 1815 – 1914* (Cambridge, Cambridge University Press,) 2014.

<sup>25</sup> Ibid., 27.

<sup>26</sup> Ibid., 2.

<sup>27</sup> Ibid.

of the ‘Concert of Europe’ that ironically it had helped to precipitate.<sup>28</sup> The diplomatic solutions authored by agreement amongst the powers of Europe no longer had a longstanding mechanism for continued negotiation and the Great Power conflicts that followed did little to encourage new multi-lateral agreements to stabilize the situation. The British Admiralty perceived a strategic vulnerability within the British Empire as a result, and sought to rectify this. The construction of *Warrior* fits into this paradigm. New industrial, economic and political forces that had developed since *Simoom* was laid down shaped Britain’s decision to adopt neutrality as a standing policy and were vital to *Warrior*’s construction. This methodological framework represents the application of new military history employed to fully understand the era that produced *Warrior*.

In completing this study, several different primary resources are used. These include the records of the Parliamentary debates, papers from the Admiralty, and the press coverage of political and economic issues in the quality press such as *The Times* and *The Royal Gazette*. Together these sources shed light on the role of the state in the passage of the Naval Estimates and the Budget, offer coverage of the debates ongoing in Parliament and reveal British concerns about potential naval threats in the 1840s and 1850s. Scientific and industrial developments can be followed through such sources as the professional military journal, *The United Service Magazine*, which details the perceived threat from the technological naval development across the Channel. The publications of the Royal Society that examined the incorporation of iron into naval vessels also play a role in this study. Records of shipbuilding companies, such as R. Napier and Sons: responsible for the construction of *Simoom*, will also be used where

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<sup>28</sup> Ibid.

available.<sup>29</sup> Each of these different sources bases contributes something significant to the broader questions concerning this study and allows a consideration of such questions as why *Warrior* was constructed in 1860? How did industry, economy and political interests shape the constriction of this frigate? How did the expansion and consolidation of the British Empire shape naval strategy? The three themes: politics, economy and industry, will be explored in this discussion of *Warrior's* 1860 construction.

### **The Strategic Role of Mid-Nineteenth Century Frigates**

At the end of the Napoleonic Wars, frigates and ships of the line fulfilled a distinctive strategic role for the Royal Navy. Frigates undertook reconnaissance operations, raiding enemy trade, convoy guard duty and packet service.<sup>30</sup> Conversely, ships of the line primarily focused on blockading enemy harbors, simultaneously cutting off enemy trade through these conduits and keeping the main part of an enemy's fleet bottled up within.<sup>31</sup> Ships of the line epitomized the famous 'wooden walls' immortalized in the Royal Navy anthem "Hearts of Oak," that defended Britain from invasion from the continent.<sup>32</sup> Unsurprisingly, ships of the line represented theoretically the most powerful weapons available to the Royal Navy during this period. Under the British rating system, these warships carried up to 120 cannon, ranging from 12 pounders to the devastating 32-pound long guns.<sup>33</sup> Frigates were far less imposing. Even the largest: razees like

<sup>29</sup> Brown et all, *Conway's History of the Ship: Steam, Steel and Shellfire*, 49.

<sup>30</sup> Donald L. Canney, *Sailing Warships of the US Navy*, (Annapolis, Naval Institute Press, 2001,) 23-6. Packet service was assigned commonly to non-rated ships like sloops of war, cutters, and brig, though frigates would be used when neither of these ships were available or practical alternatives.

<sup>31</sup> David Ross, "Victory (1765)" *The World's Greatest Battleships: An Illustrated History*, (London, Amber Books, 2013,) 30-1.

<sup>32</sup> "Heart of Oak." *Military Music Lyrics: Napoleonic Guide: British Music*, [http://www.napoleonguide.com/music\\_hearts.htm](http://www.napoleonguide.com/music_hearts.htm), Accessed June 2, 2015.

<sup>33</sup> Ross, "Victory (1765)" *The World's Greatest Battleships*, 30-1. Most 'ships of the line' also carried 64 pounders on the main deck, typically used to devastate enemy decks with canister before boarding. The Royal Navy favored the smaller 74 third-rate ships of the line, because of its relative maneuverability and

HMS *Indefatigable*, officially carried no more than 44 guns, though captain's personal modifications could push this total upwards to 50 or more.<sup>34</sup> Throughout the nineteenth century, the Royal Navy did not maintain fleets of both ships of the line and frigates. Instead the Admiralty sought to fulfill its strategic needs through a single type of vessel: frigates.

Following the end of the Napoleonic Wars, the Admiralty constructed very few ships of the line, opting instead to focus their construction efforts upon frigates. Though Nelson's decisive victory at Trafalgar is traditionally highlighted as the beginning point for nineteenth century British naval hegemony, the last decade of the conflict saw the British and the French engage in a massive construction and reconstruction campaign focused on ships of the line.<sup>35</sup> Though many of these warships would be scrapped after 1815 and despite the issues plaguing the construction projects of this period, this campaign had left the Admiralty with a glut of well-built wooden sailing ships of the line ready for action.<sup>36</sup> This was not the only factor influencing the British to construct frigates at the beginning of the nineteenth century. Ships of the line were expensive to

economy, whereas the French and Spanish favored the larger 84 or 101 second and first rate (respectively). The Spanish *Santísima Trinidad*, engaged and captured at Trafalgar, was one of the largest ships afloat, bearing 136 guns. The difference in theoretical firepower was often made up by the superior gunnery training and seamanship of the crew employed by the British. Royal Navy gun crew were well known to get off twice or three times the number of broadsides to their French or Spanish counterparts.

<sup>34</sup> *Indefatigable* was made famous by C. S. Foster's *Hornblower* books and the 1990s television series of the same name. *Indefatigable* represented a rarity amongst razees, being cut down in 1794 (razees were reconstructed third and fourth rate battleships constructed by removing the upper decks to create a vessel possessing relatively good sailing qualities and significant firepower). Most were 'rebuilt' during the second half of the Napoleonic Wars, mainly to confront the threat posed by the United States Navy's super-frigates, epitomized in USS *Constitution*, and the need to repurpose several ships of the line that were outdated by new French construction. C. S. Forester, *Mr. Midshipman Hornblower*, (London, Penguin Books, 2006) and Canney, *Sailing Warships of the US Navy*, 23.

<sup>35</sup> Richard Glover, "The French Fleet, 1807-1814; Britain's Problem; and Madison's Opportunity," *The Journal of Modern History*, Vol. 39, No. 3 (Sep., 1967), 229-35.

<sup>36</sup> Ibid. Many of these ships had been constructed out of unseasoned, or green, wood, undermining their longevity. The Royal navy also favored oak as their primary construction material for warship hulls, but, in the period between 1805-15, they constructed many ships out of whatever wood was available with the shifting economic and political undercurrents of the last decade of the Napoleonic Wars.

build and maintain, requiring a crew of well over 700 men to adequately sail and fight.<sup>37</sup>

Frigates, comparatively, were far less expensive to build, and required a less numerous, though a more skilled, crew. However, ships of the line continued as the backbone of the Royal Navy until iron construction was seriously considered by the Admiralty as a viable alternative to wood.

By 1850, the Royal Navy had already undergone one significant technological shift. Reliable steam engines had been incorporated onto many ships as an auxiliary to sail power, though the Royal Navy continued to favor canvas because of its global strategic requirements.<sup>38</sup> New constructs were fitted with steam engines and screw propellers, and older warships were modified to accommodate this new technology.<sup>39</sup> Steam had also begun to influence the strategic outlook of the Royal Navy on a global scale. Coaling stations were established at locations with little commercial, but high strategic value.<sup>40</sup> Coal had also been established as a necessary component of industrial iron production, binding together steam power, coal mining and metallurgical production before the Royal Navy embarked on its iron construction projects.<sup>41</sup> With the increasing power of naval ordnance brought on by the Industrial Revolution, iron hull construction offered the possibility of relative invulnerability to enemy fire. Coupled with the Royal Navy's need to fulfill the strategic needs of the British Empire on a global

<sup>37</sup> Ross, "Victory (1765)" *The World's Greatest Battleships*, 30-1. Most 'ships of the line' also carried 64 pounders on the main deck, used to devastate enemy decks with canister before boarding.

<sup>38</sup> The Royal Navy built very few paddle steamers, because of the detrimental effects this design had on a ship's broadside. When screw propulsion was developed, the Royal Navy began building warships with this design, and converted many others. HMS *Rattler*, a 9-gun sloop of war launched in 1843, was the first Royal Navy construction to possess this feature. J. J. Colledge, Ben Warlow, *Ships of the Royal Navy: The Complete Record of all Fighting Ships of the Royal Navy* London, Chatham Publishing, 2006, 287.

<sup>39</sup> Ibid.

<sup>40</sup> "Saint Helena, Ascension, and Tristan da Cunha". *The World Factbook*. Central Intelligence Agency. <https://www.cia.gov/library/publications/the-world-factbook/geos/sh.html>. Retrieved July 4, 2015.

<sup>41</sup> Webb, *Modern England*, 113.

scale economically, the Admiralty sought a new methodology of maintaining empire. Ships of the line increasingly proved to be too slow, too vulnerable to newly developed ordnance pieces, and too expensive for the Royal Navy to build and maintain. Frigates offered the possibility to preserve a strong Royal Navy satisfying the budgetary needs of a peacetime Parliament.

*Simoom* was undeniably designed as a frigate. This designation only changed with its reassignment as a troopship during the Crimean conflict.<sup>42</sup> *Warrior* was designed as and continued to fulfill the strategic capabilities of a frigate, while inheriting the responsibilities traditionally assigned to ships of the line.<sup>43</sup> By 1860, frigates represented the primary, though not the sole, strategic consideration for the British to maintain their formal and informal holdings throughout the imperial international order through naval force.<sup>44</sup> *Warrior*'s construction encapsulated this strategic development for the nineteenth century Royal Navy.

Strictly speaking, *Warrior* was constructed as a frigate style warship. Though the Admiralty officially rated *Warrior* a third rate ship of the line, this represented the size of this warship's crew, and should not be taken as an accurate portrayal of its anticipated capabilities or construction style.<sup>45</sup> By 1860, it became increasingly difficult for the Admiralty to compare newly constructed military craft through the traditional rating system because of advances in the size of the ordnance placed on these ships. Royal Navy warships no longer fired solid iron balls. Instead, warships were now using

<sup>42</sup> Brown et all, *Conway's History of the Ship: Steam, Steel and Shellfire*, 49 and Lyon and Winfield, *The Sail and Steam Navy List*, 242.

<sup>43</sup> Ross, "Warrior (1861)," *The World's Greatest Battleships*, 52.

<sup>44</sup> Gunboats, like those Fuller discusses in his book, *Empire, Technology and Seapower*, provided further support for the Admiralty in secondary naval theatres.

<sup>45</sup> Ross, "Warrior (1861)," *The World's Greatest Battleships*, 52.

explosive ordnance, capable of inflicting far more damage than previously possible.<sup>46</sup>

These technological developments in ordnance, in part, was what allowed *Warrior* to compete with continental ironclads like *Gloire*. Nevertheless, *Warrior*'s single long gun deck and good sailing qualities betray this craft as a frigate.

The conversion from wooden to iron hull construction, encapsulated by the transition from *Simoom* to *Warrior*, highlights the role frigates played in the defense and expansion of the political and economic boundaries of the British Empire. New technology, reflected in the development of iron hull construction, must be closely examined to fully understand both the development of these two frigates and the broader trends represented by these craft. Unlike the rival French warship, *Gloire*, *Warrior* was designed to be capable of both domestic and overseas operation and supported the role of the Royal Navy in maintaining Britain's imperial hegemony. Iron hulled and ironclad frigates were increasingly asked to bear a broader range of military applications than had previously been undertaken by increasingly outdated and vulnerable warships. During the nineteenth century, frigates morphed from craft tasked with raiding and reconnaissance duties to warships undertaking a broader role in the military defense of the overseas trade and political British Empire. The decade and a half between *Simoom*'s conceptualization and *Warrior*'s launch comprises the linchpin of this transition period.

### **Technological Change and the Construction of Iron Frigates: *Simoom* to *Warrior***

*Simoom* represented the first serious British attempt to incorporate iron into the oceangoing fleet of the Royal Navy. Other developers were far less ambitious,

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<sup>46</sup> Ibid., 53.

constructing experimental craft limited to the ports, rivers and streams of the British Empire.<sup>47</sup> These experiences allowed the Royal Navy to draw upon the prior knowledge and experience of the British private mercantile industry when the Admiralty considered iron hull construction. These private interests had already established iron in multiple industrial applications and demonstrated that this metal was a viable alternative material to wood for ship constructions.<sup>48</sup> This shipbuilding industry was centered in the Scottish Lowlands, around Glasgow, though there were other centers in the United Kingdom.<sup>49</sup> Though not a dominant firm in this industry, R. Napier and Sons represented one of the most prominent builders of mercantile vessels in the Empire.<sup>50</sup>

This company's founder, Robert Napier, was far better known for his talents with steam engines, and their incorporation into private merchant and passenger vessels and Royal Navy warships.<sup>51</sup> These engines were available, as were shipbuilding contracts, to all interested parties possessing sufficient capital to pay for these constructs. This included foreign governments. Most of Robert Napier's production was, however, centered on domestic and Royal Navy contracts.<sup>52</sup> The quality of Robert Napier's steam engines was well known within Admiralty circles. In 1838, Robert Napier received a contract to build two engines for HM Sloop *Stromboli* and HM Sloop

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<sup>47</sup> James Phinney Baxter III, *The Introduction of the Ironclad Warship*, (Annapolis, Naval Institute Press, 2001,) 33.

<sup>48</sup> Ibid.

<sup>49</sup> James Napier, "Preface" *The Life of Robert Napier of West Shandon*, (London, Blackwood and Son, 1901.)

<sup>50</sup> Ibid. R. Napier and Sons had several different names throughout its existence: Napier & Sons, Napier Brothers and R. Napier and Sons are only three examples. This represented the fluidity of the industry and the vast capital required to construct these ships, often requiring partnerships and agreements between siblings and outside sources of revenue represented by the frequent name changes.

<sup>51</sup> Napier received a number of tenders for these engines, ranging from the paddle steamer *Helensburg* to the Royal Navy's HM Sloop *Vesuvius*. Ibid., 18-38.

<sup>52</sup> Ibid.

*Vesuvius.*<sup>53</sup> Following completion of these two contracts, Robert Napier fully expected that the Admiralty would provide him with more business, given the Royal Navy's efforts to incorporate steam into their surface fleet.<sup>54</sup> Robert Napier was disappointed, however. The Admiralty provided him with no more business until the Admiralty was confronted over its procurement policy in Parliament.<sup>55</sup>

In the debates surrounding the 1843 Naval Estimates, Captain Henry John Rous addressed the ability of Robert Napier's engines compared with his competitors. Rous expressed "his surprise that the engines of Mr. [Robert] Napier, or those of Messrs. Maudaley and Field, [another firm] were not patronized in preference to those of Messrs. Seward, because the former never failed, while the great friction of the latter was much complained of."<sup>56</sup> Following this confrontation, Robert Napier became the Admiralty's primary builder of steam engines.<sup>57</sup> The relationship between the Admiralty and Robert Napier granted his firm significant advantage when competition for the tenders for the *Simoom* class opened. It should be no surprise that R. Napier and Sons obtained the largest and most expensive of the ten tenders.<sup>58</sup> This preexisting relationship also almost certainly influenced the Admiralty decision-making process when the Navy Board decided which ships were to be scrapped from this project. The Admiralty sought to use the preexisting industrial advantages provided by the British

<sup>53</sup> Ibid., 71-2.

<sup>54</sup> Ibid., 72-3.

<sup>55</sup> Ibid., 73-81 and "SUPPLY—NAVY ESTIMATES," *House of Commons Debates*, 3 March 1843, Vol. 67, cols. 266-88.

<sup>56</sup> Ibid., 287-8.

<sup>57</sup> Napier, *The Life of Robert Napier of West Shandon*, 121-47. Achieving contractual primacy within the Admiralty was not the highlight of Napier's career. Founded in 1839, Napier was one of the primary investors in the British and North American Royal Mail Steam Packet Company, better known today as the Cunard Line (builder of the SS *Lusitania*).

<sup>58</sup> Lyon and Winfield, *The Sail and Steam Navy*, 242.

domestic industry: a practice that, with *Simoom*, would provide a sound basis for further development, but far from a satisfactory product.

Problems with *Simoom*'s construction emerged quickly. By 1850, the issues were obvious even to the most uninterested reader of *The Times*. Writing in a "Letter to the Editor" to *The Times* on May 20, 1850, Rear-Admiral Sir Charles Napier stated, "I should recommend them [the Admiralty] to fire a shot or two through the *Simoom*."<sup>59</sup> Sir Charles Napier was frustrated at the Admiralty's efforts thus far to incorporate iron (and other technological developments afforded by the British industrial economy) into the Royal Navy during the late 1840s. He criticized the late Board of Admiralty for building "an iron fleet without ascertaining whether iron was a fit material for ships of war."<sup>60</sup> He further lambasted the present Board for "getting rid of them [ships of the *Simoom* project] without ascertaining that iron is not a fit material for ships of war."<sup>61</sup> Technological incorporation, while proceeding through new Royal Navy construction and the reconstruction of various warships like HMS *Caledonia*, was not advancing fast enough for the Rear Admiral, and the current course pursued by the Admiralty was costing the British coffers far too much. Technology, for Sir Charles Napier, represented the way forward for the Royal Navy, and the means to secure British naval hegemony for the foreseeable future.

Sir Charles Napier was one of the most vocal supporters of the incorporation of technology afforded by Britain's industrial position. Sir Charles Napier pursued this

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<sup>59</sup> Charles Napier, "To The Editor Of The Times" *The Times*, (London, England,) Thursday, May 23, 1850; pg. 5. As far as I can tell, there was nothing beyond a very distant Clan relationship between Sir Charles Napier and Robert Napier, though there is definitely the possibility of a familial relationship that played itself out in the well-attested patronage networks of the British Empire.

<sup>60</sup> Ibid.

<sup>61</sup> Ibid.

simultaneously through his “Letters to the Editor” printed at various point in *The Times*, and his own speeches in Parliament. Particularly telling are Sir Charles Napier’s remarks questioning Admiralty progress in steam incorporation during the 1845 Naval Estimates. Sir Charles Napier stated that he

“was sure that the right hon. Baronet [Sir Robert Peel] was as anxious as he was himself that this country should have as effective a steam force as possible. All that he asked was to have an investigation as to the present Steam Ships in the Navy, so that they might see whether they had or had not been proceeding on right and sound principles. It was not from any political motive that he pressed this on the Government, but he considered it was absolute folly to throw hundreds of thousands of pounds away in building ships which were useless.”<sup>62</sup>

Serving as a Member of Parliament for several different ridings between 1841 and his death in 1860, Sir Charles Napier clearly did not represent only Admiralty interests, evidenced by his criticism of Admiralty technological incorporation in 1845.<sup>63</sup> Published in 1851, and edited by his cousin, Major-General Sir William Napier, Sir Charles Napier’s collection of letters *The Navy: Its Past and Present State*, outline his position on the technological progression of the Admiralty amongst other ongoing arguments he had with that institution.<sup>64</sup> Writing to the Secretary of the Admiralty in 1827, Sir Charles Napier had the following to say on the Admiralty’s efforts on incorporating steam into the fleet:

“I believe it is generally thought, that the invention of steam navigation will be injurious to the interests of this country, and hurtful to our naval superiority; and the Government seem to be of that opinion, by the little attention they have bestowed on it.

I am inclined to think, that so far from diminishing our naval superiority, it only required that invention to make it more triumphant than ever, and at the

<sup>62</sup> “THE NAVAL ESTIMATES,” *House of Commons Debates*, 14 February, 1845, Vol. 77, cols 510-1.

<sup>63</sup> Charles Napier, “To The Editor Of The Times” *The Times* London, England, Thursday, May 23, 1850; pg. 5.

<sup>64</sup> Rear Admiral Sir Charles Napier, *The Navy: Its Past and Present State in a Series of Letters*, (London, John & Daniel A Darling, 1851.)

sane time diminish the expenses of war; and I shall endeavor, as concisely as I can, to point out to you, for the information of the Lord High Admiral, my reasons for entertaining such an opinion.”<sup>65</sup>

Sir Charles Napier thought that, by incorporating steam, the Royal Navy could assure superiority at sea economically through domestic technology. Steam power was a byproduct of Britain’s industrial position, and many British companies, like the aforementioned R. Napier and Sons, were at the forefront of this technological development.<sup>66</sup> The British industry was at the fore of technological development: the British Admiralty only had to take what private industry already possessed, and reengineer it for warfare. For Sir Charles Napier, steam was only the beginning.

Though Sir Charles Napier was not the sole, or definitive, spokesperson for technological integration into the Royal Navy, his role in this process cannot be underestimated. Sir Charles Napier argued for incorporation of several different technologies, including steam, screw propulsion and the iron hull technology under discussion here. Sir Charles belonged to the British military elite and was elected to several different ridings over the first half of the nineteenth century. Despite his frequent missteps and overreaches, Napier’s opinion was highly valued in the public discourse over the capacity of the Royal Navy. He became a self-appointed expert on the technological capacity of the Royal Navy, through both his speeches in Parliament and *The Times*. In this regard, he was not unique. Several other individuals frequently voiced their opinions on the state of their particular military branches through *The Times* during the nineteenth century.

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<sup>65</sup> Ibid., 47.

<sup>66</sup> Napier, *The Life of Robert Napier of West Shandon*.

*The Times* represented the single most important publically available discourse concerning the elite and the broader Empire as the newspaper of record. Not only did *The Times* record important births and deaths, military promotions and battles, but it represented a discourse on the trends concerning the British elite. Though *The Times'* readership would have been well aware of Sir Charles Napier's limitations, particularly his attacks on certain members of the Admiralty, he remained an accessible source on technology during a period when the Royal Navy was actively attempting to obscure its own developments from the international public, in combination with inaccessibility of much of the scientific jargon. Napier represented a conduit between naval scientists like Captain Halsted, and the readership of *The Times*, though always with his own opinion highlighted.

Although he was originally apathetic towards the *Simoom* project, Sir Charles Napier's attitude soon changed. His aforementioned "Letter to the Editor" presented to *The Times* on May 20, 1850, represented only the beginning of his war of words with the Admiralty over the (perceived) mishandling of the *Simoom* 'project'.<sup>67</sup> Writing to the Editor of *The Times* on June 14 1850, Sir Charles Napier commented on the recently conducted tests performed on *Simoom*.<sup>68</sup> The results, as he stated "were rather curious."<sup>69</sup> "The splinters from the iron were most destructive, and the holes so large that they could not be plugged up in action."<sup>70</sup> Sir Charles Napier, serving as a combat officer during the Napoleonic Wars, The War of 1812 and the Syrian War, was seen as

<sup>67</sup> Charles Napier, "To The Editor Of The Times" *The Times* (London, England,) Thursday, May 23, 1850, pg. 5.

<sup>68</sup> Charles Napier, "To The Editor Of The Times" *The Times* (London, England,) Monday, Jun 17, 1850; pg. 5.

<sup>69</sup> Ibid.

<sup>70</sup> Ibid.

an expert on a ship's capacity to resist enemy fire during hostile operations.<sup>71</sup> Sir Charles Napier's role as a political and military elite was not a unique circumstance within the nineteenth century British Empire. His vocal support for the technological improvement of the Royal Navy in combination with his exemplary military service made him a valued commentator on these topics in *The Times*.

*Simoom*'s apparent inability to resist enemy fire was further emphasized by Sir Charles Napier's comments about the effect that the iron used to construct *Simoom* had on the shells fired upon it.<sup>72</sup> Sir Charles Napier continued on to say that "the most extraordinary thing was that nearly every shell split into fragments: this will save our enemies from firing shell."<sup>73</sup> This effect, combined with the fragmentation of the wrought iron used to construct *Simoom*, would be devastating to those manning the guns. This destructive effect was unacceptable to planners in the Admiralty, representing the primary reason why *Simoom*, and the other two ships of this 'class', *HMS Vulcan* and *HMS Megaera* were reassigned as troopships when the opportunity arose.<sup>74</sup>

The Royal Navy iron incorporation project was not condemned because of the test conducted on a single butt of iron. Following the results of this testing, the Admiralty ordered a broader series of experiments to reassess the viability of the iron project embarked on in 1845-6. These experiments, conducted between 1849 and 1851, are summarized and expanded on in a report prepared by Captain E. Pellew Halsted.<sup>75</sup> This report was not publically accessible until 1862, when the Royal United Service

<sup>71</sup> "Biography: Charles Napier" *Biography: Charles Napier*

[http://www.royalnavalmuseum.org/info\\_sheets\\_charles\\_napier.htm](http://www.royalnavalmuseum.org/info_sheets_charles_napier.htm)

<sup>72</sup> To be clear, the Admiralty used a butt of iron of the same thickness and similar metallurgy as that used to construct *Simoom*, not the half-constructed frigate itself.

<sup>73</sup> Napier, "To The Editor Of The Times" *The Times* (London, England,) Monday, Jun 17, 1850; pg. 5.

<sup>74</sup> Lyon and Winfield, *The Sail and Steam Navy List*, 242.

<sup>75</sup> Captain E. Pellew Halsted, "Iron-Cased Ships: The Simoom Experiments of 1849, 1850, 1851 – Spherical Shot and Shell," in the *Royal United Service Institute*, January 1, 1862.

Institution published it, possibly in response to public questions about the delay between *Simoom* and *Warrior*.<sup>76</sup> The report was also edited to better reflect the launch of *Warrior* and HMS *Black Prince* in 1860 and 1861 respectively.<sup>77</sup> Beginning with attempts to address the capacity of constructs of wood and iron to resist fire from shot and shell (which he points out were never the original purpose of the tests performed by the Admiralty), Captain Halsted underlines the inconsistency of the demonstrations performed on the condemned ships, HMS *Lizard* and HMS *Ruby*.<sup>78</sup> Without delving too deeply into Captain Halsted's extensive discussion of the results of the various shot sizes on several thicknesses of iron plate and wooden construction, he does point out a critical flaw in Admiralty efforts to ascertain the effectiveness of iron to resist fire. This oversight would prove to be the critical element that differentiated *Warrior* from *Simoom*.

During these experiments, the Admiralty fired upon construction of iron alone and wood alone, but never the two in combination.<sup>79</sup> Captain Halsted represented this omission delaying Admiralty efforts to construct ships of iron.<sup>80</sup> He argued that "Ships Cased with Iron" (iron plate placed over a wooden hull) became "Ships Made of Iron," when the former would prove to be an effective synergy offering protection beyond what wood and iron could offer singularly.<sup>81</sup> Captain Halsted argued, had the Admiralty been more perceptive to the nuances of iron construction, the Royal Navy could have possessed a ship like *Warrior* before 1860.<sup>82</sup> The question of wood or iron, according to

<sup>76</sup> Ibid.

<sup>77</sup> Ibid., 141. *Black Prince* was the second ship of the *Warrior* class.

<sup>78</sup> Ibid., 140-2.

<sup>79</sup> Ibid., 141.

<sup>80</sup> Ibid., 146.

<sup>81</sup> Ibid., 141-6.

<sup>82</sup> Ibid., 146-7.

Captain Halsted, has been answered, but the Admiralty did not act effectively upon the information acquired from the experiments conducted between 1849 and 1851.

Following the Admiralty's efforts on *Simoom* and the other ships of that class, the Royal Navy abandoned their attempts to incorporate iron into the fleet.<sup>83</sup> British naval experiences during the Crimean War served to reshape Admiralty desire for iron incorporation into the fleet and their understanding of the project's necessity. During the conflict, Parliamentary expenditure on the Royal Navy jumped significantly, rising from £6.5 million in 1852 to £16.6 million pounds in the last year of the war with Tsarist Russia.<sup>84</sup> Much of this money was used to refurnish ships placed in ordinary with crew, ordnance and supplies for an overseas campaign. However, a significant portion of this funding was used to build ships to reduce the fortifications defending Sevastopol: floating batteries. The conflict with Tsarist Russia highlighted the need to reconfigure the Royal Navy to effectively challenge enemy port fortifications and ordnance presented during the Crimean War.

The British floating batteries, copied from pre-war French designs primarily provided suppressing fire for the British, French and Sardinian troops fighting around coastal fortifications, taking counter-fire from the Russian batteries, like those defending Sevastopol.<sup>85</sup> Constructed of iron plates riveted to a wooden backing, the capacity of these ships to withstand fire from enemy ships would become particularly important for

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<sup>83</sup> Lyon and Winfield, *The Sail and Steam Navy List*, 242.

<sup>84</sup> "WAYS AND MEANS – THE BUDGET" *House of Commons Debates*, 30 April 1852, Vol. 121, cols. 25-6 for the 1852 purposed naval expenditure and "SUPPLY—NATIONAL REVENUE AND EXPENDITURE—STATE OF THE COUNTRY" *House of Commons Debates*, 24 February 1843, Vol. 66, cols. 1279-80 for the monies used in 1856.

<sup>85</sup> David K. Brown, *Before the Ironclad: Development of Ship Design, Propulsion and Armament in the Royal Navy, 1815-60*, (London, Conway Maritime Press, 1990,) 156-8.

Admiralty designers after war's end.<sup>86</sup> Following the end of the conflict with Tsarist Russia, many of these floating batteries were scrapped, assigned to harbor duty or were used as target practice for Army and Admiralty demonstrations. HMS *Trusty*, launched in 1855, would serve both as a harbor guard along the Thames following the cessation of hostilities with Tsarist Russia, and as a target for Admiralty demonstrations from 1859-60.<sup>87</sup> It was in the latter capacity that *Trusty* would prove to be intrinsically important to the successful construction of *Warrior* as an iron warship.

Between 1859 and 1860, the Admiralty conducted a series of artillery demonstrations at the Shoeburyness military facility. The new 32 pounder guns forged by Armstrong, could be used for a variety of purposes, ranging from reducing enemy fortifications, defending shore emplacements and naval dockyards or used on navy vessels. According to a notice posted in *The Times*, the 1859-60 Shoeburyness tests were originally done in order to ascertain the effectiveness of these guns in comparison to competitors like Whitworth.<sup>88</sup> It soon became apparent that these test would have unforeseen consequences for the development of iron naval construction within the Royal Navy. This realization was quickly reflected in the announcements printed in *The Times*. The notice for the demonstrations conducted September 19 1859 explicitly mentions the testing done to determine *Trusty*'s capacity to resist the fire of the extremely powerful Armstrong and Whitworth guns.<sup>89</sup> Written on May 28, 1860 a column entitled "Trials With Mr. Whitworth's Gun" printed in *The Times* states that with

"the smooth bore 68 [pounder], when used close, the dent made by the shot in the armor-plate has varied from 1 to 1 ½ and 2 inches in depth, and where three

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<sup>86</sup> Ibid.

<sup>87</sup> Lyon and Winfield, *The Sail and Steam Navy List*, 240-2.

<sup>88</sup> "Military And Naval Intelligence," *The Times* (London, England), Monday, Jan 10, 1859, 10.

<sup>89</sup> "Military And Naval Intelligence," *The Times* (London, England), Tuesday, Sep 27, 1859, 9.

or more shots have struck the same place the plate has been shattered to pieces and the huge oak timber frame of the vessel behind the armor considerably started and shaken. No shot, however, has been forced into the body of the ship. With the Armstrong guns the conical shot has very nearly passed through the four inch iron slabs; but in no one instance, we believe, has it completely done so.<sup>90</sup>.

This column subverts the original purpose of the demonstrations of Armstrong's guns, which was to highlight the destructive capacity of this ordnance.<sup>91</sup>

The Admiralty reacted after realizing *Trusty* could withstand bombardment from Armstrong's guns, particularly after repairs were carried out on the rotten wooden backing of the floating battery.<sup>92</sup> In hindsight, much of the degradation of *Trusty*'s wooden construction can be attributed to Admiralty neglect of *Trusty* and the other floating batteries following the Crimean War. The repairs, originally done to supplant the damage inflicted by Armstrong's 32-pounders, were reportedly expanded, replacing the rotten structural material.<sup>93</sup> However, the testing done after these repairs revealed an unintended consequence of the demonstrations. As indicated in the May 28, 1860 column printed by *The Times*, the wooden backed armor plates were far more resilient to the bombardment presented the guns built by Armstrong and Whitworth than solely iron plates.<sup>94</sup> The Admiralty had solved the brittle iron issue that had doomed the *Simoom* 'class' as warships.<sup>95</sup> The *Trusty* demonstrations revealed a methodology by which iron, previously revealed as overly brittle for naval combat, could be employed in

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<sup>90</sup> "Trials With Mr. Whitworth's Gun," *The Times* (London, England), Monday, May 28, 1860, 12.

<sup>91</sup> "Military And Naval Intelligence," *The Times* (London, England), Monday, Jan 10, 1859, 10. Many similar tests were done in order to highlight and reinforce the imperial strength of the British Empire in the wider world. This served to reassure the British public of the supremacy of their Empire in the international world order.

<sup>92</sup> "Military And Naval Intelligence," *The Times* (London, England), Monday, Mar 19, 1860, 12.

<sup>93</sup> Ibid.

<sup>94</sup> "Trials With Mr. Whitworth's Gun," *The Times* (London, England), Monday, May 28, 1860, 12.

<sup>95</sup> Halsted, "Iron-Cased Ships: The Simoom Experiments of 1849, 1850, 1851 – Spherical Shot and Shell," in the *Royal United Service Institute*, January 1, 1862.

the naval defense of the British Empire. These revelations were further highlighted in the Jones armoring system used to construct *Warrior* in 1860.

The Jones armoring system was closely dissected in the August 6, 1860 "Military and Naval Intelligence" column.<sup>96</sup> The column describes a sequence of Portsmouth tests during the first part of 1860 on HMS *Griper*, using HMS *Excellent* as a firing platform.<sup>97</sup> *Griper*, due to be broken up, was cut down and reconstructed with armor plating ranging from 2 1/2" to 4 1/2" thick upon one side.<sup>98</sup> This was done to determine the effectiveness of an armor system developed by Mr. Josiah Jones, the proprietor of a shipbuilding firm out of Liverpool, to resist fire from modern British guns.<sup>99</sup> Jones's armor system is explicitly stated to be similar to the methodology used by the French to construct *Gloire*. Understanding the capacity of the British guns to penetrate this armor would have important wartime ramifications against Britain traditional rival.<sup>100</sup> Second, building upon the underlying assumption that the British guns were the best in world, the Admiralty sought to develop a system of securing their ships against enemy fire, with particularly the *Warrior* class.<sup>101</sup>

This effort is further emphasized by Admiralty payment for this extremely expensive construction, though there is some indication that this was done only after the

<sup>96</sup> "Naval And Military Intelligence, *The Times* (London, England), Monday, Aug 06, 1860. 12.

<sup>97</sup> HMS *Excellent* refers to the shore establishment and gunnery training school established at Portsmouth in the nineteenth century. Various ships of the line no longer needed or deemed unfit for active service was used in this capacity. HMS *Excellent* during the test discussed here was the former first rate HMS *Queen Charlotte*, launched in 1810. "HMS Excellent: History." *Royal Navy*.

<http://www.royalnavy.mod.uk/our-organisation/where-we-are/training-establishments/hms-excellent/history>. Accessed June 3, 2015.

<sup>98</sup> "Naval And Military Intelligence, *The Times* (London, England), Monday, Aug 06, 1860. 12.

<sup>99</sup> *Ibid.*

<sup>100</sup> *Ibid.*

<sup>101</sup> *Ibid.*

successful test done on *Griper*.<sup>102</sup> Quoting directly from the “Military and Naval Intelligence” column, the iron plating attached to *Griper* was tested to

“the very utmost, seven out of the nine shots being directed upon one plate, and four out of the seven being a repetition of blows on the same spot. The result of this severe test, as far as the iron plates are concerned, must be of the most satisfactory nature to the patentee as proving the soundness of his invention. The plates have been indented to a certain extent, but in no place have they been pierced or fractured by the shot.”<sup>103</sup>

This result represented a favorable improvement over the dismal results of *Simoom*, conducted a decade earlier.<sup>104</sup> The article, though it does not mention an explicit link to *Simoom*, points out a fundamental difference between the iron structure used to build *Simoom* and the construct attached to *Griper*: wood.<sup>105</sup> Wood represented the critical piece in successful iron construction for the Royal Navy.

*Warrior* embodied the genesis of British technological development in 1860. Instead of solely iron construction, as in *Simoom*, *Warrior*’s construction represented a reversal of the ironclad process. Instead of iron plates being bolted onto a wooden frame, *Warrior* was an iron construct reinforced by wooden backing.<sup>106</sup> *Warrior* was not a new revelation that forever changed the development of warship construction. This ship was a hybrid of old and new technology that reflecting particular developments and needs of the time. The timing *Warrior*’s construction will be further emphasized in a close discussion of the British Empire’s economic situation between *Simoom* and *Warrior*.

<sup>102</sup> Ibid.

<sup>103</sup> Ibid.

<sup>104</sup> Ibid., and Napier, “To The Editor Of The Times” *The Times* (London, England), Monday, Jun 17, 1850; pg. 5.

<sup>105</sup> “Naval And Military Intelligence, *The Times* (London, England), Monday, Aug 06, 1860. 12.

<sup>106</sup> Ross, “Warrior (1861)” *The World’s Greatest Battleships*, 54-7. This book uses the commissioning date of the warship in question, 1861 rather than the launch date of 1860 for *Warrior*.

## Frigate Defense of Maritime Trade

The nineteenth century British economy was not built within the confines of the British Isles. Instead, Britain's economy was at the center of the global commercial arrangement of the British Empire.<sup>107</sup> This economic order was not stagnant, but changed based upon deliberate diplomatic, military and political efforts by Parliament, the Admiralty and other British establishment bodies operating independent of and conjointly with one another.<sup>108</sup> By 1860, the British, acting upon the advantages fostered by the size of their mercantile and naval fleets, embraced free trade as the mainstay of their economic vision for the global commercial order. The Royal Navy not only enabled the British to fully embrace free trade as the mainstay of their economic outlook, but also forced the Royal Navy to fully defend the economic gains acquired through free trade. This simultaneous role of the Admiralty during the period bookended by *Simoom* and *Warrior* must be closely examined to fully understand the role played by the Royal Navy in the adoption and defense of free trade.

The nineteenth century British economy was built upon the back of British industry. The need for a wider market for the industrial firms of the United Kingdom informed the expansion of the imperial domains, pushing British economic policy towards free trade. This is reflected in the growth of the monetary value of British exports during the first part of the nineteenth century. Between the end of the Napoleonic Wars in 1815 and 1832, the valuation of goods exported from Britain rose from £43 million to £65 million.<sup>109</sup> The monetary increase in trade continued right

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<sup>107</sup> Kennedy, *The Rise and Fall of the Great Powers*, xv, 154-5.

<sup>108</sup> Ibid.

<sup>109</sup> "Foreign and Colonial Trade of the United Kingdom, 1801-1832," in *English Historical Documents: 1783-1832*, (New York, Oxford University Press, 1969,) 550.

through to the end of the nineteenth century, with adjustments based on diplomatic disputes and warfare between Britain and trading partners.<sup>110</sup> It should be highlighted that these numbers include only the exports from the British Isles, and not the monetary value of the growing imperial domains.<sup>111</sup> This increase growth in trade was coupled with a massive expansion in the number of mercantile and naval vessels flying the British flag.<sup>112</sup> This is unsurprising, given the geography of the United Kingdom. Merchant ships were lynchpin of the British economic system, both as carriers of trade and as defenders of the seaborne economy.<sup>113</sup> The economic requirements of a growing Empire and economic globalization were increasingly considered as a fundamental part of the strategic vision of the Admiralty by the mid point of the nineteenth century, and were manifested in the construction of ships like *Simoom* and *Warrior*.

A critical element in the nineteenth century history is British economic liberalization. This narrative is reflected in a number of different historical documents, including the Parliamentary debates on the Yearly Budget. The Budget presented by Sir Robert Peel's government in 1845 provides a good example of the ongoing processes of this era. One of the overarching themes of this debate was the maintenance of funds for government institutions like the Royal Navy. Under previous governments, funding had been obtained through tariffs on the import and export of goods from outside the British Empire.<sup>114</sup> Peel's government approached this monetary question differently,

<sup>110</sup> Kennedy, *The Rise and Fall of the Great Powers*, xv, 154-5.

<sup>111</sup> "Foreign and Colonial Trade of the United Kingdom, 1801-1832," in *English Historical Documents: 1783-1832*, 550.

<sup>112</sup> Kennedy, *The Rise and Fall of the Great Powers*, xv, 154-5.

<sup>113</sup> Ibid.

<sup>114</sup> Ibid., 144-7.

incorporating liberal economic policies, reshaping the imperial economy. The 1843 Budget had incorporated both tariffs and a Property and Income Tax to deliver government revenue.<sup>115</sup> These measures had provided a significant government surplus, amount to about £3.1 million.<sup>116</sup> In 1845, Peel responded asking the House of Commons to either lower tariffs, or cut his newly instituted income tax.<sup>117</sup> It is obvious which revenue source the Prime Minister favored.

Speaking in the debate, Peel argued that reducing the Property and Income Tax would undermine the capability of the Army and Admiralty to defend the Empire, highlighting the inherent instability of the monies provided by tariffs.<sup>118</sup> In war, trade, and thus tariffs, could be reduced by enemy action though blockade of the British Isles, or, a *guerre de course* against seaborne trade with the United Kingdom.<sup>119</sup> Tariff reduction on foreign imports underlines Peel's commitment to international free trade. Free trade would allow British manufactures access to the global marketplace, granting access to the cheapest raw materials, within or outside imperial dominions. This policy allowed Britain to draw powers like the United States closer diplomatically, granting access to a growing marketplace and undermining the tumultuous relationship between the two nations during the nineteenth century.<sup>120</sup> Though this commitment would eventually split his Tory party over the repeal of the protectionist Corn Laws, Peel had undeniably committed the British Empire to free trade.<sup>121</sup> Subsequent governments would further

<sup>115</sup> "FINANCIAL STATEMENT—THE BUDGET" *House of Commons Debates*, 14 February 1845, Vol. 77, cols. 463-469.

<sup>116</sup> Ibid., 346-7.

<sup>117</sup> Ibid., 455-510.

<sup>118</sup> Ibid., 463-469.

<sup>119</sup> Beeler, *Birth of the Battleship*, 23-6.

<sup>120</sup> Webb, *Modern England*, 303-4, 317-8.

<sup>121</sup> Ibid., 273-7.

enshrine this program as the fundamental British economic policy in the nineteenth century.

Tariffs represented an indirect means for the British government to control the import and export of foreign goods, in addition to providing public revenue. According to the debates in Parliament, sugar, coffee and wool are the focus of altered (lowered) tariffs in 1844.<sup>122</sup> This would continue into 1845, and subsequently. In 1845, the estimated tariffs on foreign imports for 1845-6 amounted to about £19.5 million, according to Peel.<sup>123</sup> The actual totals presented in the 1846 Budget for that year confirmed this estimate, placing the total governmental revenue for 1845-6 at about £19.7 million.<sup>124</sup> This increase continued despite the repeal of further import duties, like the Corn Laws.<sup>125</sup> Peel's tariff reforms laid the groundwork for later expansion of free trade, defining British economic order for the second half of the nineteenth century. Admiralty warship construction represented one manifestation of the new economic reality for the British Empire.

The timing of *Simoom*'s construction superficially appears to have little to do with the expansion of the British economy. However, it was the strength and demands of the global empire that fueled the continued development of the Royal Navy and its global strategic mandate. The Admiralty continuously built new ships, both to expand their fleet in response to shifting needs, and replacing worn out or otherwise obsolete craft.<sup>126</sup> While *Simoom* represented one response to an emergent threat from the continent, the

<sup>122</sup> "IMPORT DUTIES," *House of Lords Debates*, 13 June 1844, Vol. 75, cols. 685-6.

<sup>123</sup> "FINANCIAL STATEMENT—THE BUDGET" *House of Commons Debates*, 17 February 1845 Vol. 77, cols. 573-5.

<sup>124</sup> "WAYS AND MEANS—THE BUDGET," *House of Commons Debates*, 29 May 1846, Vol. 86, cols. 1430-2.

<sup>125</sup> Webb, *Modern England*, 273-7.

<sup>126</sup> Lyon and Winfield, *The Sail and Steam Navy List*.

type of craft chosen by Admiralty for this particular building program is far more important for understanding the British economy. Though the Admiralty continued to construct ships of the line until the middle of the nineteenth century, these craft no longer fulfilled the needs of the British Empire.<sup>127</sup> Instead, frigates came to dominate both the construction projects of the Admiralty, and the strategic planning undertaken to preserve British trade in peace and war.<sup>128</sup> The *Simoom* project failed to incorporate iron successfully into the Royal Navy for combat purposes.<sup>129</sup> This weakened Admiralty efforts to build ships of iron, but it did not sour the British on frigate construction. Frigates continued to be built, albeit of wood, in response to shifting needs and circumstances. Frigates played a significant part of British seizure of oceanic hegemony during the Napoleonic conflict, and the role of these ships expanded as Britain committed to trade liberalization. Free trade forced a reevaluation of the British fleet, and frigates formed an essential part of this picture. *Warrior's* construction was part of this reimagining.

The repeal of the ‘Corn Laws’ by Peel’s Tory government in 1846 set the British Empire on the trajectory towards free trade. Following the final removal of the tariffs on grain importation in 1849, no one seriously considered returning the British Empire to a protectionist economic scheme.<sup>130</sup> Britain committed to be both the manufactory of the world, and the shipper of the world’s merchandise.<sup>131</sup> Though the British mercantile fleet periodically appeared vulnerable over the eighteenth and first half of the nineteenth

<sup>127</sup> David Ross, “Victoria (1859)” *The World’s Greatest Battleships: An Illustrated History*, London, Amber Books, 2013, 50-3.

<sup>128</sup> Lyon and Winfield, *The Sail and Steam Navy List*.

<sup>129</sup> Ibid., 242 and Brown et all, *Steam, Steel and Shellfire*, 49.

<sup>130</sup> Webb, *Modern England*, 292-3.

<sup>131</sup> Kennedy, *The Rise and Fall of the Great Powers*, 157-8.

century, concerns with the capacity of the Royal Navy to maintain and defend their ships at sea emerged by the middle of the nineteenth century. This concern is particularly evident in the years following the Crimean War, though this will be discussed later. Free trade had become the lifeblood of the British imperial economy, but the British populace became increasingly wary of any external threat to their position in global trade.

*The United Service Magazine* reflects the nexus of the United Kingdom military culture. Though a professional journal written for a British military audience, this magazine was accessible to the public and was read by a wide audience with an interest in Britain's military affairs. This is evident in the June 1850 edition. One piece, entitled "The Rival Navies" highlights British concerns about their strategic and economic security.<sup>132</sup> The unnamed author discusses the attributes that make Great Britain the international naval hegemon, stating that British naval strength

"is derived from her resources in wealth and energy, her skill, her experience, and above all the character of the minds that direct, and the men who conduct her naval operations. Something also may be ascribed to that familiarity with triumph, that confidence in victory, that idea which teaches the British seaman that his nation *must* be successful, and that the last degree of infamy and shame would accompany her defeat upon the sea."<sup>133</sup>

The author clearly believed that it is Britain's natural position to dominate the waves. A detractor would find this position hard to dispute in 1850, given the devastating defeats inflicted upon the French, Spanish, Dutch and Danish fleets a half-century prior.<sup>134</sup> These victories had become engrained in British cultural heritage, yet the author still felt the need to highlight the apparent natural supremacy of the British at sea.

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<sup>132</sup> "The Rival Navies," *The United Service Magazine and Naval and Military Journal*, December 1850.

<sup>133</sup> Ibid., 497-8.

<sup>134</sup> Arthur Herman, *To Rule the Waves; How the British Navy Shaped the Modern World*, (New York, Harper Perennial. 2004,) 331-418.

The global economy's expansion following the end to the Napoleonic Wars massively increased the size of the merchant fleet, highlighting the mounting need to expand the Royal Navy's capacity across the globe. Concerns about this vulnerability to the British economy are reflected in both Parliamentary debates and the British press. While previous naval strategy had dictated the British aggressively blockade and destroy enemy trade, observers increasingly pointed out that adversaries could now pursue the reverse as an effective war stratagem.<sup>135</sup> Not only would "the last degree of infamy and shame" accompany a major defeat for Britain at sea, it would also mean the end of the naval hegemony supporting the British Empire's trading capacity.<sup>136</sup> The myth of British naval supremacy, highlighted in the aforementioned quote from "The Rival Navies" was as powerful a weapon for the maintenance of British naval hegemony as actual ships. However, 'The Rival Navies" highlights the myth of British naval supremacy was challenged by rival imperial powers. How the Admiralty responded would determine the longevity of British naval strategy.

Historically, frigates never formed a part of the wooden walls that defended the British Empire. The naval victories of 1759, immortalized in the song *Hearts of Oak* were fleet actions, in which ships of the line, not frigates, played the primary role.<sup>137</sup> Nevertheless, because of the need to defend overseas trade and a far-flung Empire, and because of gunnery advances, frigates obtained primacy in the Admiralty strategic planning.<sup>138</sup> If frigates were to succeed ships of the line as the primary defender of the

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<sup>135</sup> Ibid., 444.

<sup>136</sup> "The Rival Navies," *The United Service Magazine and Naval and Military Journal*, December 1850, 497-8.

<sup>137</sup> "Heart of Oak." *Military Music Lyrics: Napoleonic Guide: British Music*, [http://www.napoleonguide.com/music\\_hearts.htm](http://www.napoleonguide.com/music_hearts.htm), Accessed June 2, 2015.

<sup>138</sup> Canney, *Sailing Warships of the US Navy*, 23-6

British Empire, the public must be convinced that these craft could effectively defend the imperial and Britain's trade. The difference in language used to announce *Warrior's* launch in *The Times* at the end of 1860 and in *The United Service Magazine* during *Warrior's* construction highlights how the Admiralty convinced the British public that frigates could effectively defend the Empire.

*Warrior's* design underscores this craft as a frigate style warship.<sup>139</sup> Comparing the language used by *The Times* and *The United Service Magazine* reveals an inconsistency in the designation of *Warrior*. The notice printed on December 31, 1860 highlights *Warrior* as a "formidable iron-cased frigate," despite the author claiming this ship as "the largest man-of-war ever built."<sup>140</sup> The language used by *The Times* helps to highlight *Warrior* as a frigate in the public consciousness.

Comparatively, *The United Service Magazine* fails to make this distinction. Appearing in the May 1860 edition of the publication, the piece "Iron-Plated Ships of War" discusses the construction of the *Gloire* class by the French, and the British "Iron-Warrior" as a response.<sup>141</sup> *Warrior* is never described as a frigate in this article.<sup>142</sup> The only designation mentioned occurs when the author states the French "Emperor [Louis Napoleon I] has just laid down at Cherbourg a ship of the line 300 feet long."<sup>143</sup> Despite this French ship's massive size, the author quickly undercut its capacity to resist enemy fire, arguing that it is "extraordinary" that this ship of the line is "to be plated with steel . . ." considering how all our experiments show that steel plates are not difficult to destroy,

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<sup>139</sup> Ross, "Warrior (1861)," *The World's Greatest Battleships*, 52.

<sup>140</sup> "Launch Of The Warrior," *The Times*, (London, England,) Monday, Dec 31, 1860, 10.

<sup>141</sup> "Iron-Plated Ships of War," *The United Service Magazine and Naval and Military Journal*, May 1860, 28-32.

<sup>142</sup> Ibid.

<sup>143</sup> Ibid., 31.

and offer less resistance than wrought iron.”<sup>144</sup> This, coupled with the praise lain upon the ordnance employed by the Royal Navy, highlighted the British Empire’s technological sophistication.<sup>145</sup> *Warrior*, included in the article as one of the “vessels of wrought iron of immense size and prodigious strength,” would have no difficulty destroying the French ship of the line at Cherbourg.<sup>146</sup> Highlighting the perceived technological superiority of the British naval technological establishment, *The United Service Magazine* advanced the case to the wider public that *Warrior* would prove an effective defender of empire.

*Warrior*’s development was shaped and reshaped by both the need to defend British free trade, and the need to enforce this reality globally. Metallurgical technology enabled the Admiralty to pursue iron frigate construction as a viable option to wooden construction. Furthered by the expanding needs of the British trade system, frigate construction quickly became the pillar in imperial defense. Frigates cannot solely be seen as active weapons of war, defending sea-lanes against enemy aggression. Instead, these craft help defend, shape and reshape British diplomacy in the global network. These realities supported Britain’s nineteenth century naval hegemony.

### **Ironclad Diplomacy**

Following the Napoleonic conflict, no nation seriously challenged the British Empire at sea.<sup>147</sup> This dominance of the world’s oceans could not last forever. By the middle of the 1840s, France had reemerged as a naval challenger to British hegemony, undermining public confidence in the Admiralty. This is represented in a number of

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<sup>144</sup> Ibid.

<sup>145</sup> Ibid., 30-1.

<sup>146</sup> Ibid., 30.

<sup>147</sup> Lambert, *The Last Sailing Battlefleet*, 19-23.

articles and translated reports from French publications in *The Times*. Though the French characterized their own fleet as inherently inferior to the Royal Navy since 1826 (though with no mention of the annihilation inflicted upon the Napoleonic Fleet during 1789-1815) in *The Times*, the British public received accounts of a growing naval threat from the continent.<sup>148</sup> In November 1844, it was reported that the French government had paid £28.4 million for the construction of 18 steamboats in July 1840, which “are nearly finished.”<sup>149</sup> Commentary attached to this report fears these ships may “be attached to the French Royal navy to serve as ships of war.”<sup>150</sup> Clearly, France’s reemergence concerned many in Britain, highlighting the need for an Admiralty response.

The translated French reports were not the only documents highlighting British unease about the return of France as a naval power. British officers, like Sir Charles Napier, also wrote in to express concern about the comparative strength of the French and British fleets. In August, 1845 an editorial in the French paper *Journal des Debates*, was reprinted in *The Times* claiming that both Lord Palmerston and Sir Charles Napier stated in Parliament that “the French navy is infinitivly superior to that of the British.”<sup>151</sup> This reflects Sir Charles Napier’s Parliamentary statement questioning the viability of the Admiralty’s steam project in Febrary 1845, maintaining it would be “absolute folly to throw hundreds of thousands of pounds away in building ships which were useless.”<sup>152</sup> Sir Charles Napier later write to *The Times* reflecting his ongoing concern about the

<sup>148</sup> “The Paris papers of Wednesday announce the,” *The Times*, (London, England,) Friday, Nov 22, 1844, 4.

<sup>149</sup> Ibid.

<sup>150</sup> Ibid.

<sup>151</sup> The Paris papers of Friday, received by our ordinary correspondent,” *The Times*, (London, England,) Monday, Aug 04, 1845, 4.

<sup>152</sup> “THE NAVAL ESTIMATES,” *House of Commons Debates*, 14 February, 1845, Vol. 77, cols 510-1.

French steam fleet's capacity.<sup>153</sup> These statements simultaneously highlighted and informed the British public's perception of the strength of their fleet in comparison to naval rivals. France, representing the most consistent competitor of the British Empire, was of particular concern. The hegemony behind the British Empire's economic fortunes was perceived to be under threat. This, in part, necessitated a response by the Admiralty during the 1840s. This response emerged partially in the *Simoom* class.

France's reemergence as a credible naval threat to the United Kingdom was not the only factor influencing the construction of the *Simoom*-class. French colonial expansion, particularly in North Africa, influenced the development of Admiralty construction projects as an effective counter. Whereas the growth of France's navy represented a challenge to the the British overseas economy, French colonial expansion threatened the security of Britain's imperial possessions. Given that the British Army was an appendage of the Royal Navy, an expansion of the Army's overseas requirements necessitated an extension of the Royal Navy, separate from any other factor.<sup>154</sup> After seizing what is today known as Algeria in 1830, the French government faced ongoing domestic resistance, eventually coalescing around Abdelkader El Djezairi by 1840.<sup>155</sup> The French eventually drove El Djezairi out of Algeria, though he continued the fight from bases just across the Moroccan border.<sup>156</sup> By 1844, the French demanded that the Moroccan Emperor, Abd al-Rahman expel El

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<sup>153</sup> Charles Napier, "To The Editor Of The Times," *The Times*, (London, England,) Monday, Jul 09, 1849, 5.

<sup>154</sup> Though the quote, "The British Army should be a projectile to be fired by the British Navy," emerged out of the Boer Wars at the end of the nineteenth century, it epitomizes the strategic understanding and role of the British Army for well over a century before the aforementioned conflict. David Brown, *The Royal Navy and the Mediterranean: Vol. II: November 1940-December 1941*, (Routledge, London, 2001), xvii.

<sup>155</sup> "We have received by our ordinary express the Paris Papers," *The Times*, (London, England,) Monday, Jul 01, 1844, 4.

<sup>156</sup> Ibid.

Djezairi, under threat of military intervention.<sup>157</sup> The British government came under increasing domestic pressure react to the French aggressions.

*The Times* further highlighted French aggression in July 1844. Reporting on a conference between the French troops fighting El Djezairi and the representatives of Emperor Abd al-Rahman, *The Times* recounted that the French troops, and by extension, the French government were “most ardent to violate the rights of nations.”<sup>158</sup>

*The Times* continued to highlight the precarious military position of Morocco against French aggression.<sup>159</sup> Calling the French a “formidable and encroaching neighbor [accounting for the French occupation of Algeria twelve years earlier,]” the article’s author highlights the military inferiority of Morocco.<sup>160</sup> The Emperor “has no standing army properly speaking. His black or negro cavalry, consisting of about 60,000, are his own body guards . . . The tactics of these troops are the same as they have been in ages past. Nothing European has been introduced into the military system of Morocco . . . The Emperor [of Morocco] has no fleet, and the dockyard of Sallee is a heap of ruins.”<sup>161</sup> The author also states the majority of Moroccan imports are either British or French manufactured goods, further highlighting the self-interest of the British mercantile sector in maintaining an independent Moroccan state.<sup>162</sup> French military efforts to stamp out El Djezairi’s rebellion in Algeria threatened Moroccan sovereignty, undermining British economic interests. Though naval reconstruction would not prove to

<sup>157</sup> Ibid.

<sup>158</sup> Ibid.

<sup>159</sup> “Power And Resources Of Morocco: FROM OUR OWN CORRESPONDENT,” *The Times*, (London, England,) Thursday, Jul 04, 1844, 6.

<sup>160</sup> Ibid.

<sup>161</sup> Ibid.

<sup>162</sup> Ibid.

be the only British response to the disturbance in North Africa, Britain had to prepare for all potentialities. The *Simoom*-class of iron steam frigates was part of this vigilance.

The ongoing French efforts to secure their Algerian colonial rule was not the only source of friction between France and the British Empire. The French had also begun the reconstruction of their fleet. However, France worked to reduce the British establishment's concern over the new naval forces. These negotiations fit into the machinations of the 'Concert of Europe' established following the Napoleonic Wars. Writing in November, 1844, *The Times* reported the French government sought to maintain peaceful relations with the British Empire, despite ongoing disputes over Moroccan rights and Tahiti.<sup>163</sup> *The Times* reported that the "former [the Paris papers] are still principally occupied with the reception of the King [Louis Philippe] in England, which appears to have very considerably increased the hopes of all who look upon the maintenance of peace between the two countries as an advantage that ought not upon slight grounds to be placed in jeopardy."<sup>164</sup> *The Times*, and much of its readership, recognized that peace with France was economically preferable to war. Open conflict threatened the trade routes sustaining the fiscal vitality of the British Empire, but Britain would also be forced to undertake military operations on a worldwide scale. The expenses that this would entail would be enormous. Though the British could not allow the French to gain a naval advantage over the Admiralty, they understood the realities of the diplomatic theatre. Britain used diplomatic methods prior to the Crimean War allowing the Admiralty to abandon unsuccessful projects like *Simoom*, without damaging British interests globally.

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<sup>163</sup> "We have received by express the Paris papers of," *The Times*, (London, England,) Monday, Nov 25, 1844, 4.

<sup>164</sup> Ibid.

Despite potential military need for *Simoom*, Britain quickly abandoned the iron steamship project.<sup>165</sup> *Simoom*'s construction as a frigate was abandoned not only because the iron proved to be unsuitable for combat. The British could abandon *Simoom*'s construction, because of their participation in the 'Concert of Europe.' The simultaneous pursuit of a naval agreement with France and Admiralty warship construction allowed Britain to choose whichever proved the most effective. Conversely, should one option fail, the British would not be left without a viable option to secure their imperial interests. When the iron used in *Simoom* proved to be unsuitable for naval combat operations, the British could still rely upon their diplomatic negotiations through the 'Concert of Europe' to safeguard their security. Britain consistently sought to fulfil the strategic needs of empire through a multiplicity of methodologies, including both military and diplomatic approaches.

The 'Concert of Europe' enabled the informal maintenance of peace between the Great Powers of Europe, and the United Kingdom recognized its value for their own trading interests with both Europe and the broader world. Though the British did not fully trust the 'Concert' to maintain absolute peace between the Great Powers of Europe, this diplomatic institution represented their preferred methodology until the failure of the framework following the Crimean War. *Simoom* was abandoned because its construction material proved to be unsuitable for combat, but the British neglected to further pursue iron as a viable war material because of the continued peace arising from the 'Concert.'

The Crimean War changed the diplomatic basis of Europe, destroying the 'Concert' that had provided the United Kingdom with a framework to devise peaceful

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<sup>165</sup> Brown et all, *Conway's History of the Ship: Steam, Steel and Shellfire*, 49.

solutions to European rivalries.<sup>166</sup> No comparable structure was established immediately following the end of the Crimean War in 1856.<sup>167</sup> Instead, Britain, and the other powers of Europe, navigated a far more precarious diplomatic landscape. Britain had to employ a strategy safeguarding both interests in Europe and abroad. Most importantly, the British had to maintain the global trade that formed their economic lifeblood. Traditional historiography sees the British Empire taking an isolationist stance following the Crimean War, only to form alliances with Tsarist Russia and France in the lead up to the First World War. This argument represents only part of the story. Britain did not step away from Europe. Instead, following the Crimean War, Britain became, as Abbenhuis put it in her 2014 book, *Age of Neutrals*, “the occasional neutral power *par excellence*.<sup>168</sup>

Britain's adoption of neutrality as the *de facto* stance during periods of conflict epitomized Britain's primary method to safeguarded their trade and limit the scale of belligerent activity. Nineteenth century Britain reformed its international legal system, repositioning its system of prize law to protect economic interests and the rights of neutrals. British agreement the 1856, *Paris Declaration Regarding Maritime Law*, represented Britain's disavowal of their former belligerent rights.<sup>169</sup> Two major provisions: the elimination of privateering as a means of waging economic warfare, and the establishment of the principle, ‘neutral ships equals neutral goods’, except in the

<sup>166</sup> Schroeder, *Austria, Great Britain and the Crimean War*, xi-xvii.

<sup>167</sup> Ibid.

<sup>168</sup> Abbenhuis, *An Age of Neutrals*, 95.

<sup>169</sup> “Declaration Regarding Maritime Rights. Paris, 16 April 1856,” ICRC: *Treaties and Parties to Such Treaties*, <https://www.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=473FCB0F41DCC63BC12563CD0051492D>accessed June 3, 2015. Britain had previously pursued a far more aggressive stance against enemy trade; condemning neutral ships for attempting to trade with the enemy or for have enemy goods onboard. This was one of several causes for the outbreak of war with the United States in 1812.

case of war materials, represented a fundamental shift in British economic thinking and had important implications for the Royal Navy.<sup>170</sup> The adoption of these provisions safeguarded British trade from belligerents: in wartime, the Admiralty trusted the Royal Navy to eliminate enemy commerce raiders.<sup>171</sup> However, one element of the *Declaration* retains a belligerent aspect clearly influenced by British interest. Blockade: the fundamental strategy of British economic warfare remained legal in the *Declaration*, albeit with the caveat that it must be effective in order to be binding.<sup>172</sup> Effectively blockading an enemy port, given the size of the Royal Navy, never concerned the Admiralty until the early days of the First World War.<sup>173</sup> The nineteenth century British Empire sought to safeguard their own trade while simultaneously enhancing their own advantages in economic warfare. Adopting neutrality as their default diplomatic position allowed the British to pursue these collective advantages.

As armed neutrality was the most common position Britain adopted from 1856, the Royal Navy still had to be prepared for armed conflict. Blockade was the primary means of economic warfare for Britain during the eighteenth, nineteenth and twentieth centuries. During the Napoleonic Wars, blockades had been maintained largely by ships of the line.<sup>174</sup> By the middle of the nineteenth century, ships of the line remained immensely powerful weapons, but, as wooden constructs, became increasingly vulnerable to modern shot employed by European navies and shore defenses.<sup>175</sup> Considering the expenses incurred building and maintaining such warships, the

<sup>170</sup> Ibid.

<sup>171</sup> Ibid.

<sup>172</sup> Ibid.

<sup>173</sup> Papastratigakis, "British Naval Strategy," *The International History Review*, 2010, 643-4.

<sup>174</sup> Cordingly, *Cochrane*, 82.

<sup>175</sup> "Victoria (1859), *The World's Greatest Battleships*, 50-3.

Admiralty sought alternatives to maintain blockade as a wartime weapon. Iron ships offered resistance to all but the most modern shot.<sup>176</sup> The announcement of *Warrior*'s launch in *The Times* highlights this ship as "invulnerable:" an exaggeration, but not very far off of the mark.<sup>177</sup> Such resistance would enable these ships withstand all but the heaviest enemy ordnance, allowing the British to maintain an effective cordon around enemy ports.<sup>178</sup> Frigates were chosen because they offered the Admiralty tactical flexibility at reasonable expense. *Warrior* was built to fulfill both the traditional strategic role of frigates, and those that had been added with the demise of the ship of the line as a means of effective blockade in modern warfare.

Technological improvement of ordnance did not arise out of the experiences of the Crimean War. Britain had begun constructing guns capable of obliterating wooden ships before the Crimean War.<sup>179</sup> The continental rivals of the Empire were not far behind the United Kingdom in this regard.<sup>180</sup> The experiences of the Crimean War against these weapons helped highlight the need to construct ships capable of maintaining blockade.<sup>181</sup> The test performed on *Trusty* showcase the Admiralty's efforts not only to determine the capacity of their own ordnance, but the capability of armoring systems to resist shore establishment fire. Developing an armoring system capable of resisting enemy fire was critical to allow the British to maintain blockade as a viable weapon in their wartime arsenal. Though the British adopted neutrality as their primary

<sup>176</sup> Ibid.

<sup>177</sup> "Launch Of The Warrior," *The Times*, (London, England,) Monday, Dec 31, 1860, 10.

<sup>178</sup> "Declaration Regarding Maritime Rights. Paris, 16 April 1856," ICRC: *Treaties and Parties to Such Treaties*, <https://www.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=473FCB0F41DCC63BC12563CD0051492D> accessed June 3, 2015.

<sup>179</sup> "Victoria (1859), *The World's Greatest Battleships*, 50-3.

<sup>180</sup> Ibid.

<sup>181</sup> Ibid.

means of maintaining their global trade, the Admiralty also sought to provide additional security. *Warrior's* construction helped strengthen Britain's stance on neutrality, maintaining this diplomatic policy following the Crimean War. Nevertheless, the previously discussed trends fail to adequately explain why *Warrior* was launched in 1860. A close examination of the full circumstances surrounding the build up to *Warrior's* launch will reveal why construction of this warship took place in 1859-61.<sup>182</sup>

Despite cooperating to contain Tsarist Russia, France continued to represent the single most significant naval threat to the British Empire following the Crimean War. By 1860, this was no longer about the French possessing the capacity to construct warships of steam that had concerned *The Times* in 1844.<sup>183</sup> Instead, the French had embraced metallurgical warship construction. Writing to *The Times* in January 1860, Mr. Donald M'Kay expressed his concern about the secretive warship construction undertaken by the French.<sup>184</sup> M'Kay wrote "that it is very difficult for a stranger to gain access to the French navy yards, and that nobody, without exception, is allowed to go on board the iron cased frigates and steam rams unless he is in the uniform of the French army or navy."<sup>185</sup> This level of secrecy is telling. Though the British had previously built sea-going warships of iron, *Simoom* had proven to be a failure in the Admiralty's eyes. Obviously, the French felt that they had solved the metallurgical issues undercutting *Simoom's* combat capability, and were prepared to build based on

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<sup>182</sup> 1859 was the year *Warrior* was first laid down, and 1861 was when this ship was officially commissioned by the Royal Navy. My use of 1860 previously refers to the date of *Warrior's* launch, December 29, 1860.

<sup>183</sup> "We have received by our ordinary express the Paris Papers," *The Times*, London, England, Monday, Jul 01, 1844, 4.

<sup>184</sup> "America: Liverpool, Saturday," *The Times*, (London, England,) Monday, Jun 18, 1860, 10. M'Kay, according to the article was a well-known British shipbuilder whom would be well acquainted with the usual course of ship construction in both wood and iron. I use M'Kay, rather than McKay, as it likely would have been rendered today, to preserve what *The Times'* article uses.

<sup>185</sup> Ibid.

these advances. Further concerning M'Kay in his article was the size and firepower of these warships. M'Kay considered *Gloire*, and *L'Invincible*, another ship of the *Gloire* class, to be “very formidable vessels, equal in size [length and firepower] to a 90-gun ship [a large second rate ship of the line].”<sup>186</sup> The sheer strength and size of the ships of *Gloire* class was not solely what concerned M'Kay. Rather, it was *Gloire*'s iron construction. *Warrior*'s launch cannot be seen solely as a direct response to the construction of the French *Gloire* class. Instead, *Warrior*'s construction must be seen as a response to broader trends in French technological capabilities. In 1860, the French undoubtedly possessed a working methodology to build an iron warship. The British could delay their own program no longer, beginning with *Warrior*.

Diplomatically, *Warrior* was a coup for the Admiralty. The French believed they had, in a single stroke, undercut British naval. *Warrior*'s launch on December 29 1860 destroyed whatever success the French had achieved with *Gloire*. The notice of *Warrior*'s launch, printed on December 31, 1860, effectively highlights this achievement. *Warrior* is called “a formidable iron-cased frigate, the largest man of war ever built . . .”<sup>187</sup> *Gloire*, comparatively, is highlighted as a poor sea keeping ship, rolling “almost dangerously.”<sup>188</sup> This deficiency is, according to the article's author, commonplace amongst ironclad warships, unless during construction, “especial pains are taken to guard against such a defect.”<sup>189</sup> Presumably, *Warrior*'s builders had taken these precautions. *Gloire* represented the pinnacle of French warship construction, and *Warrior* proved to be a more capable weapon by nearly every consideration. The British,

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<sup>186</sup> Ibid.

<sup>187</sup> “Launch Of The Warrior,” *The Times*, (London, England,) Monday, Dec 31, 1860, 10.

<sup>188</sup> Ibid.

<sup>189</sup> Ibid.

though they had not initiated the trend, knew they could not give up their naval hegemony without a fight. They were able to respond quickly because of the industrial and political advantages Britain possessed. The Admiralty realized that British rule of the waves represented the critical element in their economic success during the nineteenth century. To maintain this advantage, the Admiralty would ensure that Britain remained at the cutting edge of naval construction, albeit in a reactive role. *Warrior* was but a small piece in the maintenance of British naval hegemony and empire in the nineteenth century.

*Warrior* was the first successful ocean going Royal Navy warship constructed of iron. The British had possessed the capacity to construct warships out of this material before 1845. It was only in the years following the Crimean War, when the experiences of that conflict coupled with the iron construction capacity of European rivals, that the Admiralty fully committed to technologically advanced warship construction. The ships of the *Warrior* class cannot solely be seen as a direct response to *Gloire*. *Warrior's* construction fits into a broader narrative about the continuous naval hegemony maintained by the British Empire throughout the long nineteenth century.

The construction of the *Warrior*-class warships represents the collective manifestation of the industrial, political, diplomatic and economic trends shaping this era of the liberal British Empire. *Warrior's* metallurgical construction induced the continuation of the iron technology first explored militarily through the *Simoom* class.<sup>190</sup> This trend was further responded to French construction of *Gloire* in 1859 and the

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<sup>190</sup> Lyon and Winfield, *The Sail and Steam Navy*, 242.

increasing power of enemy ordnance, demonstrated in the Crimean War.<sup>191</sup> *Warrior* was designed and built as a fast sail rigged frigate with auxiliary steam power, enabling this warship to serve in an overseas capacity and fulfill domestic military requirements.<sup>192</sup> The simultaneous need of the British to defend the overseas trade representing the economic lifeblood of the Empire and maintaining political influence with sovereign foreign entities required *Warrior* to be a powerful and capable of swift overseas deployment.<sup>193</sup> *Warrior's* construction was not only undertaken to meet the military needs exposed by the French launch of *Gloire*, but as a broader response to the economic, political and technological trends present during the middle of the nineteenth century. The nineteenth century British Parliament undoubtedly recognized the important role played by the Admiralty in maintaining empire and trade. This is reflected in Parliamentary directives passed with the yearly Naval Estimates, passed as a part of the Budget.

Partially in response to the launch of *Gloire*, the 1860 Naval Estimates authorized the Admiralty to pursue new construction with a further £1 million above its predecessor in 1859.<sup>194</sup> Given the destruction of the ‘Concert of Europe’ and the diplomatic vulnerability of the United Kingdom, Parliamentary directives for Royal Navy construction are not surprising.<sup>195</sup> Though the £1 million was directed specifically for new construction as a reaction to French construction, centered on *Gloire*, this money was also clandestinely directed to address several of the issues discussed

<sup>191</sup> “Iron-Plated Ships of War,” *The United Service Magazine and Naval and Military Journal*, May 1860, 28-32.

<sup>192</sup> Ross, “Warrior (1861),” *The World’s Greatest Battleships*, 52.

<sup>193</sup> Ibid.

<sup>194</sup> “SUPPLY—NAVY ESTIMATES,” *House of Commons Debates*, 14 March 1859, Vol. 153, cols. 130-1

<sup>195</sup> Ibid.

previously.<sup>196</sup> Given the trends ongoing by 1860, the Admiralty had to react, in order to safeguard both British economic interests supported by seaborne trade and its international diplomatic position. *Warrior*'s construction did not represent a break with previous Admiralty policy. Instead, *Warrior* was a continuation of previous responses, tempered by burgeoning trends in the political, diplomatic, economic and industrial spheres, shaping the British Empire in the middle of the nineteenth century.

The Royal Navy reinforced the nineteenth century dominance of the British Empire. *Warrior* represented a telling moment in the historical narrative, highlighting the methodology employed by the British to maintain both their hegemony of the world's oceans, and their imperial domain. The transition from *Siroom* through *Warrior* circumscribes the broader trends shaping and reshaping the nineteenth century British Empire. Diplomatically, these weapons do not only represent the damage inflicted on the enemy through blockade and the destruction of ships, men and material. Instead, the anticipated role played by *Warrior* during peacetime was far more nuanced, enabling the maintenance of Britain's place at the pinnacle of the diplomatic, economic and industrial nineteenth century world.

### **Conclusion**

*Warrior*'s construction consistently represents a pivotal point in the historiography of the nineteenth century Royal Navy. Scholars like Andrew Lambert see *Warrior* as a revolutionary turn, ushering in a new age of warship construction, assuring British dominance of the oceans and the world.<sup>197</sup> Others, like Howard J. Fuller, challenge this traditional narrative. Arguing that Britain did not absolutely rule the nineteenth century

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<sup>196</sup> Ibid.

<sup>197</sup> Lambert, *The Creation of the Steam Battlefleet, 1815-1860*, 77.

waves through inherent naval superiority, Fuller questions *Warrior's* position as the keystone of continued British sea power at the mid point of the nineteenth century.<sup>198</sup> Fuller instead focuses on other measures of British naval capacity, though he neglects to discuss the development of these weapons or the political, economic and industrial systems underpinning the true strength of these ships.<sup>199</sup> In truth, *Warrior's* capability as a military weapon can never be known, because it never faced combat during its years of service.<sup>200</sup> Arguing over *Warrior's* absolute capability as a naval vessel simply repeats the arguments put forth by Lambert, albeit in the opposite vein. Historians should instead focus, like this study of the transition between *Simoom* and *Warrior*, on how these weapons developed out of and as a response to, the trends strengthening and threatening the British Empire during the nineteenth century.

British economic prosperity depended largely upon their oceanic naval system. Defense of British trade was paramount, as was the defense of broader British strategic and diplomatic interests internationally. These two paradigms represented the fundamental pillars of British naval policy throughout the nineteenth century. The transition of iron shipbuilding from *Simoom* to *Warrior* played a significant role in the continued maintenance of Britain's naval hegemony. The British began the century with naval dominance following their annihilation of the French and Spanish fleets at Trafalgar in 1805, but naval hegemony was not assured throughout the century. The British Admiralty was forced to navigate a web of diplomatic, economic and technological changes that threatened to thwart or enhance their own visions of British

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<sup>198</sup> Fuller, *Empire, Technology and Seapower*, 1-10.

<sup>199</sup> Ibid., 226-30.

<sup>200</sup> Ross, "Warrior (1861)," *The World's Greatest Battleships*, 52. *Warrior's* lack of combat experience proved to be an effective deterrent, because potential rivals were never completely sure of its capability.

rule of the world's oceans. With *Simoom*, the Admiralty did not develop an effective weapon for Queen Victoria's arsenal: they did not fail a second time with *Warrior*. The British Empire dominated much of the world through their control of the oceans during the nineteenth century, and the Royal Navy played a singularly important role in maintaining that mastery.

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